

**Kudinov N. V.** (Don State Technical University, Rostov-on-Don), **Porksheyan M. V.** (Don State Technical University, Rostov-on-Don) **Comparison of splines based on power polynomials and hyperbolic functions** ■

The paper describes an approach of finding the terms of the sequence that arises when the error of the wave problem numerical solution is estimated.

**Theorem.** Let  $L$  be a linear combination of elements  $\{1, x, x^2, x^3\}$  of vector space over the field  $\mathbb{R}$  a solution of the Laplace equation  $\Delta^2 f_1 = 0$ , and  $M$  is a linear combination of elements  $\{1, x, ch(kx), sh(kx)\}$  of vector space over the same field, which is a solution to the equation  $-\Delta f_2 + k\Delta^2 f_2 = 0$ . Then at  $k = \frac{\sqrt{12}}{h}$  for  $\forall x \in [a, b]$  linear combination  $L$  is dominant, that is  $L(x) > M(x)$ , for any rational Neumann boundary conditions  $\frac{\partial f_1}{\partial x} \Big|_{x=a} = \frac{\partial f_2}{\partial x} \Big|_{x=a} > 0$  and  $\frac{\partial f_1}{\partial x} \Big|_{x=b} = \frac{\partial f_2}{\partial x} \Big|_{x=b} < 0$ . This property makes it possible to improve the smoothness of determining the boundary conditions and restore the field given by random data [1].

## REFERENCES

1. *Sukhinov A. I., Chistyakov A. E., Semenyakina A. A., Nikitina A. V.* Parallel implementation of the problems of substance transport and bottom surface reconstruction based on high-order accuracy schemes // Computational methods and Programming. – 2015. – Vol. 16, Is. 2. – p. 256–267. DOI: 10.26089/NumMet.v16r225 ■

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